SOCIETIES AND ACADEMIES

LONDON

Royal Society, November 18.—"On the Specific Heats of Minerals." By J. Joly, B.E., Trinity College, Dublin. Communicated by Prof. Fitzgerald, F.R.S.

A number of experiments—carried out by the method of condensation—are tabulated in this paper, on minerals whose specific heats have not previously been determined as well as on some mineral substances previously dealt with by Kopp, Regnault, &c.

The observation of specific heat is suggested as of value in determinative mineralogy. It is, with some exceptions, nearly constant for the same chemical composition, and calculable from an assumed chemical constitution, not alone in the case of simple compounds, but in the case, often, of the more complicated silicates, &c. No difficulty is introduced into its determination by conditions of aggregation such as looseness, &c. The method by weighing in air and steam admits of its value being very simply determined, and, if great accuracy be not required, very rapidly.

The experiments made by the writer show that there is a small variation in the specific heats of minerals of the same species, accompanying slight differences in translucency, lustre, perfection of crystalline form, the tendency being for the specific heat to be a minimum in the most perfect crystals. There is, further, in some cases, a variation of quite different order accompanying pronounced differences in physical appearance, as from the transparent aquamarine to the clouded beryl, sapphire to corundum, &c.; so that a distinct and definite value exists for each variety, unaccounted for by any probable variation in chemical composition.

It appears, also, that this kind of variation obtains in the case of the isometric sulphides, pyrite, galenite, sphalerite, and in such degrees as admit of the several values being stated in numerical proportion from one substance to another. Thus, using the initial letters for the observed values, it is found that—

$$p_1 : p_2 : : g_1 : g_2 ;$$

and, if the orthorhombic disulphide of iron, marcasite, be included, the proportion

$$s_1 : s_2 : : p_1 : m : : g_1 : g_3$$

obtains very closely. The observations of other observers are included in these ratios, the existence of which, if further borne out, suggest as an explanation the existence of variations of structure of definite character affecting, in a definite way, the freedom of the atom. From this point of view, the case of marcasite would be that in which such variation proved adequate to determine a special symmetry for the aggregate.

December 9.—"Note to a Paper on the Geometrical Construction of the Cell of the Honey-Bee" (*Proc. R.S.*, No. 240, p. 253, 1886). By Prof. H. Hennessy.

The author found in the foregoing paper that a side of one of the lozenges terminating the cell was three times the difference between two parallel edges of the hexagonal prism, and from this result he constructed one of the lozenges by erecting a perpendicular at one-third of its length from one end, and from this end, with radius equal to the side, he inflected a second side of the lozenge, which gave the whole figure and also the six trapeziums forming the prism. With a compass and ruler the whole figure can be thus easily constructed.

The author further proves that the triangular pyramid which terminates the bee's cell may be inscribed in a sphere whose diameter is three times one of the edges of the pyramid. Moreover, this sphere contains within it as much of the hexagonal prism as may be measured by twice the side of a lozenge on the prism's shorter edge. These results, together with the extremely simple mode given by the author for constructing the figure, divest the problem of the complex character which it was sometimes supposed to have, and they may also assist in explaining the action of the bees in moulding the cells of the honeycomb to their observed shapes.

"The Intra-ovarian Egg of some Osseous Fishes." By Robert Scharff, Ph.D., B.Sc. Communicated by Prof. McIntosh, F.R.S.

December 16.—"On the Changes in the Proteids in the Seed which accompany Germination." By J. R. Green.

The author described experiments proving the existence in germinating seeds of a ferment resembling the proteolytic ferment of the pancreas. This exists in the resting seeds in the condition of a mesostate or zymogen, and is, on the starting of the germinative process, transformed into the active ferment. He traced the changes which it brings about in the reserve proteids of the seed, and showed that, while they passed through the stage of peptone, the nitrogen was carried to the growing points in the condition of a crystalline amide, such as leucin, asparagin, &c.

Zoological Society, December 21, 1886.—Prof. W. H. Flower, LL.D., F.R.S., President, in the chair.—Mr. Howard Saunders, F.Z.S., exhibited and made remarks on a specimen of a hybrid between the Tufted Duck and the Pochard, bred in Lancashire in 1886.—Mr. J. Bland Sutton, F.Z.S., read a paper on atavism, being a critical and analytical study on this subject.—Dr. von Lendenfeld read a paper on the classification and systematic position of the Sponges. This was based on the recent researches on the Hexactinellida, Tetractinellida, and Monaxonida of the *Challenger* Expedition, and on his own investigations on the rich Australian Sponge-fauna, particularly of the groups Calcarea, Chalinidæ, and Horny Sponges. A complete system of Sponges was proposed, and worked out down to the families and sub-families, and all the principal genera were mentioned. An approximately complete list of the literature of Sponges (comprising the titles of 1446 papers), a "key" to the determination of the 46 families, and a discussion of the systematic position of the Sponges were also contained in the paper.—Prof. Ray Lankester communicated a paper by Dr. A. Gibbs Bourne, of the Presidency College, Madras, on Indian earthworms, containing an account of the earthworms collected and observed by the author during excursions to the Nilgiris and Shevaroy Hills. Upwards of twenty new species were described.

Geological Society, December 15, 1886.—Prof. J. W. Judd, F.R.S., President, in the chair.—John Usher and Joseph Tertius Wood were elected Fellows of the Society.—The following communications were read:—Notes on *Nummulites elegans*, Sow., and other English Nummulites, by Prof. T. Rupert Jones, F.R.S. The author finds, in the "Sowerby Collection," now in the British Museum, the original specimens on which Sowerby founded his *Nummularia elegans* (1826, "Min. Conch." vol. vi. p. 76). These are partly specimens from that part of the bed "No. 29" of Prof. Prestwich's section of Alum Bay (Quart. Journ. Geol. Soc., vol. ii. (1846), p. 257, pl. ix. fig. 1), which is known to be the lowest of the Barton series; and partly some in a stone said to be from Emsworth, in Hampshire. The former are the same as those named *Nummulites planulata*, var. *Prestwichiana*, by Rupert Jones in 1852; and the latter are *N. planulata*, Lamarck (1804), and probably foreign. Thus *N. elegans* has priority over *Prestwichiana*; and as this last was determined by De la Harpe to be a variety of *N. wemmelensis*, Van den Broeck and De la Harpe, this variety should be var. *elegans*. The author thinks that, on broad zoological principles, *N. planulata* might still be regarded as the species; but, in view of the careful differentiation worked out by De la Harpe, he accepts the "specific" standing of "*wemmelensis*" as useful among *Nummulites*; but "*Prestwichiana*" has to give way to "*elegans*" for the peculiar "Barton" variety. A bibliographical history of the long-misunderstood *N. elegans*, Sowerby, descriptions of this form and of *N. variolaria* (Lam.), notes on *N. lævigata* (Brug.), and an acccount of their range in England, complete the paper.—On the dentition and affinities of the Selachian genus *Ptychodus*, Agassiz, by A. Smith Woodward, F.G.S. The genus *Ptychodus*, owing to the detached condition in which the teeth are usually found, has hitherto been imperfectly understood. Agassiz referred it to the Cestraciontidæ, on account of a supposed resemblance in the arrangement of the teeth, and Owen's researches on their microscopic structure served to confirm this view. On the other hand, several writers have pointed out characters tending to show affinity between *Ptychodus* and *Rhynchobatus*. More recently, however, Prof. Cope and the author had shown that the supposed affinities between *Ptychodus* and the Cestraciontidæ were only apparent, and in the present paper additional evidence was brought forward. The author proceeded to describe several specimens of *P. decurrens* in the British Museum, and in the collection of Mr. H. Willett, of Brighton, one of the latter, especially, containing, what had been previously entirely unknown, the dentition in part of both jaws. These specimens showed that each jaw contained six or seven longitudinal rows of teeth on each side of the median row, and that the genus must be referred to the true Rays, and not to the Cestraciont sharks, though the precise family to which *Ptychodus* belongs was more difficult to determine. On the whole the writer was disposed to assign it a place either amongst the Myliobatidæ or in their neighbourhood. The microscopic structure of the teeth was shown to be insufficient, by itself, to show their affinities.—On a molar of a Pliocene type of *Equus*, from Nubia, by R. Lydekker, B.A., F.G.S. A small collection of Mammalian remains from near Wadi Halfa had recently been placed in the author's hands; some of the bones were mineralised similarly to those of the Upper Pliocene of the Val d'Arno, or the Lower Pleistocene of the Narbadda valley. Amongst others, the most interesting is a right upper cheek-tooth of *Equus* but little worn. It evidently does not belong to any of the late Pleistocene or recent species of the genus, but to the more generalised group comprising *E. sivalensis*, &c.; though, bearing in mind the impossibility of distinguishing many of the existing species of the genus by their teeth alone, its absolute specific identity is not asserted. We may infer, then, that the ossiferous beds of Wadi Halfa are not improbably of Pliocene age, since this group of horses, both in Europe, Algeria, and India, had totally disappeared after the period of the forest-bed. Moreover, it is of interest, in view of previously expressed opinion, to find in the Tertiary of Nubia a species of this primitive group of *Equus*, which is apparently more nearly allied to the Siwalik than to the European species.

Royal Microscopical Society, December 8, 1886.—Rev. Dr. Dallinger, F.R.S., President, in the chair.—Mr. J. Mayall, Jun., called attention to a microscope, exhibited and made by Mr. Hilger after the designs of Sir A. Campbell, for measuring with great accuracy the divisions ruled upon a diffraction-plate. A special feature was the application of electricity, so that, by means of a weak battery and a galvanometer, it could be arranged that a contact should be made when passing every line, such contact being shown instantly by a deflection of the galvanometer-needle. In this way, end-measurements could be made with great accuracy.—Mr. Mayall also exhibited and described a new form of heliostat (made by Mr. Hilger) for use in solar photomicrography. The pencil of sunlight reflected from the first mirror could, by means of the second, be directed in any desired direction, affording to the worker the very great advantage of being able to place his microscope and camera in any position he pleased.—Mr. F. R. Cheshire exhibited and described an improved form of inoculating needle for use in connection with Bacterium culture-tubes. It was mounted in a wooden handle having a square ferrule which prevented it from rolling when placed upon an unlevel surface; in this was inserted a piece of silver tube, at the end of which was the platinum wire. A circular disk of silver was fixed on the tube, which, when placed in the flame of a lamp, rapidly became hot, and communicated the heat to the needle, while the small size of the tube enabled it to be introduced into the culture-tube more easily than the glass rod usually employed.—Prof. Bell called attention to some specimens exhibited of *Tænia nana*, the smallest of the human tape-worms, originally found by Bilharz in Egypt in 1850. Though extremely rare, it had the great advantage, to the physiologist at least (though not perhaps to the patient), of being found in considerable numbers. In the present instance the worms had been found in quantities in the duodenum of a girl aged seven years, at Bellegarde. The largest specimen met with was only 15 millimetres long.—Mr. J. D. Hardy called attention to a paper, by Dr. O. Zacharias, in which it was stated that Rotifers could never be revived after desiccation. He thought a protest should be entered against this, as it was within his knowledge that revivification had taken place over and over again. He had frequently tried the experiment, and had found that, when the dried mud was moistened, the Rotifers constantly revived. Prof. Stewart pointed out that a good deal must turn on what was meant by "desiccation." It was exceedingly difficult, under ordinary circumstances, to produce a condition of complete desiccation, and it was therefore very probable that in all cases of revivification there was sufficient moisture retained to preserve life. Prof. Bell said this explanation had usually been accepted as the real one when this subject perennially came to the front. The most curious part of Dr. Zacharias's paper, however, was that he did not in any way attempt to criticise the observations of his predecessors on the facts, but simply declared them to be fables, not inquiring at all into the conditions under which the revivals took place, so as to ascertain whether or not they were desiccated in the same sense in which his objects were when dried up in a granite basin. A discussion ensued, in which the President, Mr. Crisp, Mr. Michael, and Mr. Lewis joined.—Colonel O'Hara's note on the dissimilarity of appearances of crystals of blood as examined by him, and the illustrations in text-books, was read.—Mr. P. H. Gosse's paper, on twenty-four new species of Rotifera, was read, and two plates, drawn by Mr. Gosse in illustration, were handed round for inspection.

Anthropological Institute, December 14.—Francis Galton, F.R.S., President, in the chair.—The election of Mr. J. A. Otonba Payne, of Lagos, as an Ordinary Member, and of Dr. W. J. Hoffmann as a Corresponding Member, was announced.—Dr. E. B. Tylor read a paper by the Rev. G. Brown on Papuans and Polynesians, in which Mr. Brown contended that, notwithstanding physical differences, the similarity of their languages and customs prove the Papuans and the inhabitants of all the Pacific Islands have a common origin.—The following papers were also read:—Notes on songs and song-makers of some Australian tribes, by A. W. Howitt, F.G.S.—Music of the Australian aborigines, by G. W. Torrance, Mus.D.—On the aborigines of Western Australia, by R. H. Bland.

Paris

Academy of Sciences, December 27, 1886.—M. Jurien de la Gravière, President, in the chair.—The proceedings were opened with an eloquent allocution by the President on the progress and triumphs of science during the past year, with a touching allusion to the loss sustained by the Academy in the death of its distinguished members, MM. Tulasne, de Saint-Venant, Laguerre, and Paul Bert.—The allocution was followed by the announcement of the prizes awarded during the year to the successful competitors in the various branches of the physical and natural sciences:—Prix du Budget (Mathematics), Edouard Goursat; Prix Francœur (Geometry), Emile Barbier; Extraordinary Prize of 6000 francs (Navigation), Capt. G. Fleuriais 4000 francs, Capt. de Bernardières 2000 francs; Prix Montyon, 2500 francs (Mechanics), M. Rozé; Prix Plumey (Naval Engineering), M. de Bussy; Prix Poncelet (Mathematics), Emile Picard; Prix Lalande (Astronomy), M. O. Backlund; Prix Damoiseau (Astronomy), M. Souillart, and to M. Obrecht 1000 francs; Prix Valz (Astronomy), M. Bigourdan; Prix Bordin (Optics), M. R. Radau; Prix Montyon (Vital and Social Statistics), M. Victor Turquan, with honourable mention of Dr. Mireur, Cazin, and Socquet; Prix Jecker (Chemistry), divided equally between MM. Colson and Oechsner de Coninck; Prix Vaillant (Geology), the members of the French Mission to Andalusia, MM. Michel Lévy, Bertrand, Barrois, Offret, Kilian, and Bergeron, and 1000 francs to M. de Montesson; Prix Barbier (Botany), M. Eugène Collin; Prix Desmazières (Botany), MM. H. van Heurck and A. Grunow; Prix de la Fons Mélicocq (Botany), divided equally between MM. Gaston Bonnier, G. de Layens, and E. G. Camus; Prix Montagne (Botany), Dr. Quélet; Prix Thore (Entomology), M. Peragallo; Prix Montyon (Medicine), Drs. Léon Colin, Dejerine and Landouzy, and Oré, 2500 francs each, besides honourable mention with 1500 francs to MM. Cadéac and Malet, Masse, and Ollivier; Prix Bréant (Medicine), Dr. Duflocq 2000 francs, M. Ad. Guérard 1500 francs, and M. Thoinot 1500 francs; Prix Godard (Surgery), M. Bazy; Prix Lallemand (Surgery), M. W. Vignal; Prix Montyon (Experimental Physiology), M. Gréhant, with honourable mention of M. Assaky; Prix Gay (Physical Geography), M. Ph. Hatt; Prix Montyon (Unhealthy Industries), MM. Appert Brothers, and M. Kolb 2500 francs; Prix Trémont (Magnetism), M. Moureaux; Prix Gegner, M. Valson; Prix Delalande-Guérineau (Terrestrial Physics), M. Hyades; Prix Jean Reynaud (Therapeutics), M. Pasteur; Prix Ponti (Aërial Navigation), MM. Renard and Krebs; Prix Marquise de Laplace, M. E. A. Brisse.—Prizes proposed for the year 1887:—Francœur, 1000 francs, discoveries or works useful to the progress of pure and applied mathematics; Extraordinary Prize of 6000 francs, works tending to increase the efficiency of the French naval forces; Poncelet, 2000 francs, for the most useful work for the advancement of the pure and applied mathematical sciences; Montyon, 700 francs, mechanics; Plumey, 2500 francs, improvement of steam-engines, or any other invention contributing most to the progress of steam navigation; Fourneyron, 500 francs, theoretical and practical study of the progress made in aërial navigation since 1880; Lalande, 540 francs, Valz, 460 francs, and Damoiseau and Janssen, gold medals, works contributing to the advancement of astronomy; Grand Prize of the

Mathematical Sciences, 3000 francs, researches on the elasticity of one or more crystallised bodies from the experimental and theoretical standpoints; L. Lacaze, 10,000 francs each, to the authors of the best work on physics, chemistry, and physiology; Montyon, 500 francs, vital statistics; Jecker, 10,000 francs, organic chemistry; Delesse, 1400 francs, to the author of a treatise on the geological or mineralogical sciences; Barbier, 2000 francs, for any valuable discovery in surgery, medicine, pharmaceutics, or botany, in connection with therapeutics; Desmazières, 1600 francs, for the most useful work on the whole or any section of cryptogamy; Thore, 200 francs, awarded alternately for works on the cellular cryptogams of Europe, and for researches on the habits and anatomy of any European entomological species; Montagne, 1000 and 500 francs, to the authors of important works on anatomy, physiology, the development or description of the lower cryptogams; Grand Prize of the Physical Sciences, 3000 francs, researches on the phenomena of phosphorescence in animals; Bordin, 3000 francs, for a comparative study of the African, South Asiatic, and Australasian freshwater fauna; Bordin, 3000 francs, for a comparative study of the auditory apparatus in the warm-blooded vertebrates, mammals, and birds; Savigny, 975 francs, for young zoological travellers; Montyon, 750 francs, medicine and surgery; Bréant, 100,000 francs, to the discoverer of an efficacious remedy against Asiatic cholera; Godard, 1000 francs, anatomy, physiology, and pathology of the genito-urinary organs; Serres, 7500 francs, general embryology, especially as applied to physiology and medicine; Chaussier, 2500 francs, for important works on forensic and practical medicine; Lallemand, 1800 francs, for works relating to the nervous system in the widest sense of the term; Montyon, 750 francs, experimental physiology; Gay, 2500 francs, distribution of heat on the surface of the globe; Montyon, unhealthy industries; Trémont, 1100 francs, for any naturalist, physicist, artist, or mechanician needing assistance in the accomplishment of any undertaking useful to France; Gegner, 4000 francs, in aid of any *savant* distinguished by serious pursuits undertaken for the purpose of advancing the positive sciences; Petit D'Ormoy, 10,000 francs, pure and applied mathematics, and the natural sciences; Laplace, a complete edition of the works of Laplace, for the first student leaving the Ecole Polytechnique. General conditions: the Academy retains all memoirs, the authors being at liberty to obtain copies from the Secretary. Competitors must send in their papers by June 1, accompanied by a brief summary of the part containing the discovery on which they desire the judgment of the Academy. No one can claim the title of Laureate of the Academy unless awarded a prize. Honourable mention or any other formal recognition of merit does not justify the assumption of this title.

STOCKHOLM

Society of Natural Science, September 18.—Prof. Wittrock gave an account of the gypsies, chiefly in relation to Hungary, which country he had recently visited with a view to studying its various nationalities.—Dr. Skåuberg exhibited abnormal specimens of various plants he had found in Sweden last summer, viz. *Phleum pratense*, *Listera ovata*, *Linaria cymbalaria*, *Typha angustifolia*, and *T. latifolia*.—Herr Berggren exhibited a specimen, in spirits, of *Nyctalis parasitica*, which had grown on another fungus, *Russula adusta*, whilst the latter was still quite fresh. The former fungus, he said, was also at times attacked by a smaller parasitic one, imparting to it a kind of coating.—Herr Meves exhibited a specimen of *Oriolus gulbula*, shot last May, a bird very rarely found in Sweden.

Entomological Society, September 25.—Prof. Chr. Aurivillius gave an interesting account of his studies, last summer, of the habits of various species of Hymenoptera. He specially referred to one, *Odynerus muralis*, which he had found when boring holes in red-painted wooden walls, at the bottom of which it deposited its larvæ, protecting the latter against attack by making partitions of clay at intervals, and by putting a prop at the end, which it carefully covered with tiny bits of red paint, whereby these holes were almost impossible to detect.—Dr. Lampa described his observations of the remarkable keenness of the olfactory organs of the males of *Bombyx quercus*, L., whereby they were enabled to discern the females, even when far off. In one instance a female had been discovered by a male, although access to the former, which was in a cage, could only be gained through a balcony and room beyond.—Dr. Adlerz referred to an unusual case of hermaphroditism in an ant, whose left half was formed like a male, and the right like a female.

CHRISTIANIA

Society of Sciences, October 1.—The following papers were presented:—Der Ursprung der Etrusker durch zwei lemnische Inschriften erläutert, by Prof. Sophus Bugge.—Fresh contributions to our knowledge of the extension of the tube plants in Norway, by Prof. A. Blytt.—On variations in climate in the course of time (see NATURE, vol. xxxiv. pp. 220 and 239), by the same.—Ueber die Entwickelungsgeschichte der Pollenkörner des Angiospermen, by Dr. N. Wille.—Fresh contributions to our knowledge of the extension of lichen in Norway, by Herr B. Kaalaas.—Dr. G. Storm read a paper on voyages to countries north and north-west of Iceland, maintaining that the priests who, in 1285, discovered "Nya Land" (New Land) did not reach Newfoundland, but the south-eastern part of Greenland, and that the island discovered in 1194, "Svalbarde," was Jan Mayen. He further believed that the old Norsemen knew of other Arctic countries north of Russia and Norway.

BOOKS AND PAMPHLETS RECEIVED

Annual Report of the Geological and Natural History Survey of Canada, new series, vol. i.: A. R. C. Selwyn (Dawson Bros., Montreal).—Negretti and Zambra's Encyclopædic Catalogue.—Proceedings of the Royal Physical Society, Session 1885-86 (M'Farlane and Erskine, Edinburgh).—Den Norske Nordhaus-Expedition, 1876-78, XVI. Zoologi, Mollusca, II.: H. Friele (Grondahl, Christiania).—Transactions of the Sanitary Institute of Great Britain, vol. vii. 1885-86 (Stanford).—Zeitschrift für Wissenschaftliche Zoologie, xliv. Band, 4 Heft (Engelman, Leipzig).—Geological Survey of Alabama—On the Warrior Coal-Field: H. McCalley (Montgomery).—Year-book of Photography, 1887 (Piper and Carter).—Anuario de la Oficina Central Meteorolojica de Chile, 3er Cuaderno, Mayo i Junio.—Fourth Annual Report of the Metropolitan Public Gardens Association.

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